

S06-198

10/599,084

02940350aa

Amendment dated 04/02/2010

Reply to office action mailed 02/02/2010

REMARKS

Claims 1-15 are currently pending in the application. By this amendment, claims 1, 6 and 11 are amended for the Examiner's consideration. The foregoing separate sheets marked as "Listing of Claims" shows all the claims in the application, with an indication of the current status of each.

The Examiner's acceptance of the drawings is acknowledged with appreciation.

The Examiner maintains rejection of claims 1-15 under 35 U.S.C. §102(a) as being anticipated by U.S. Patent No. 6,690,965 to Riaziat et al. ("Riaziat"). The Examiner notes in his remarks that the described training and learning aspects of identifying a respiration pattern and calculating tolerance limits are not present in the Riaziat reference. Consequently, in order to move this case forward while preserving the applicant's ability to pursue broader claims in a continuation case, the claims have been amended to add these features, thereby distinguishing Riaziat.

The factual statement of Riaziat's disclosure from the prior response is relied upon as if repeated here. In particular, Riaziat discloses a technique for placing the beam on hold when the respiration, as measured by a marker placed on the surface of the patient's chest, exceeds a threshold value of eight-tenths of the maximum extension of the marker. The effect of this tolerance limit is shown in Figure 3. At regular intervals corresponding to the peak of respiration extension the beam is placed on hold.

This tolerance limit described in Riaziat is of a different character than the teaching of the present invention, and the teaching of the present invention is not anticipated by this tolerance limit describe in Riaziat. The present invention teaches an envelope which is in the same shape as the respiration signal itself, as shown by Figure 4B. This is described in the claims as "establishing spatial and temporal tolerances around said pattern." By contrast, Riaziat establishes an amplitude

S06-198
Amendment dated 04/02/2010

10/599,084

Reply to office action mailed 02/02/2010

tolerance as shown in Figure 3, which is further described as “an example of a gating signal chart” (col. 5, line 48). The question then is whether there are other examples in the Riaziat disclosure, indicating the Riaziat prior art places one skilled in the art in command of the envelope teaching provided by the present invention.

The relevant passage from Riaziat in col. 5, lines 19-37. That paragraph defines determination of the boundaries of the “treatment intervals”. The Riaziat disclosure states that, for gating purposes, “threshold points can be defined over the amplitude range of the motion signal” (col. 5, lines 22-24). Riaziat argues that motion outside the boundaries of the treatment intervals “correspond to movement that is predicted to cause unacceptable levels of movement to the tumor or tissue targeted for irradiation” (col. 5, lines 25-27). There is no suggestion here of a “treatment interval” other than what is shown in Figure 3, which excludes the outer boundaries of amplitude. This is also consistent with “treatment intervals correspond to the portion of the physiological cycle in which motion of the clinical target volume is minimized.”

Riaziat then identifies “other factors for determining the boundaries of the treatment intervals”: a) “identifying the portion of the motion signals involving the least movement of the target volume” (col. 5, lines 32-33); or b) “the portion of the motion signal involving the largest separation of the target volume from organs at risk” (col. 5, lines 34-35). These determinations appear correlated to amplitude or to the slope of the amplitude curve, and lead to the same cyclic repetition of the “beam off” determination as shown in Figure 3. There is no suggestion in these “other factors” of a tolerance envelope as described in the present invention, where the “beam off” determination is related to a “spatial and temporal tolerance” around a pattern signal, rather than being related to cyclic aspects of the amplitude curve.

In short, there is no suggestion in Riaziat of an envelope of the kind shown in Figure 4B of the present invention. The mere fact that the amplitude curve is defined

S06-198
Amendment dated 04/02/2010

10/599,084
Reply to office action mailed 02/02/2010

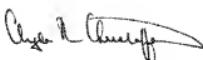
upon a time axis (col. 5, lines 15-17) does not, absent impermissible hindsight,
provide to one skilled in the art a suggestion of the present invention.

In view of the foregoing, it is requested that the application be reconsidered,
that claims 1, 2, 4-7, 9-12, 14-15 be allowed, and that the application be passed to
issue.

Should the Examiner find the application to be other than in condition for
allowance, the Examiner is requested to contact the undersigned at 703-787-9400
(fax: 703-787-7557; email: clyde@wcc-ip.com) to discuss any other changes deemed
necessary in a telephonic or personal interview.

If an extension of time is required for this response to be considered as being
timely filed, a conditional petition is hereby made for such extension of time. Please
charge any deficiencies in fees and credit any overpayment of fees to Attorney's
Deposit Account No. 50-2041.

Respectfully submitted,



Clyde R Christofferson
Reg. No. 34,138

Whitham, Curtis, Christofferson & Cook, P.C. **Customer No. 30743**
11491 Sunset Hills Road, Suite 340
Reston, VA 20190
703-787-9400
703-787-7557 (fax)